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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/628,680	07/28/2003	Thomas P. Krauss	CML01070M	4497

7590 06/14/2005

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EXAMINER

HAILE, FEBEN

ART UNIT	PAPER NUMBER
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2663

DATE MAILED: 06/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/628,680

Applicant(s)

KRAUSS ET AL.

Examiner

Feben M Haile

Art Unit

2663

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 01 March 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 6-15, 17 and 18 is/are allowed.
- 6) ☒ Claim(s) 1-4, 16 and 19 is/are rejected.
- 7) ☒ Claim(s) 5 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☒ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. In view of applicant's amendment filed March 01, 2005, the status of the application is still pending with reference to claims 1-19.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3, 16, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones et al. (US 6,108,317), hereinafter referred to as Jones, in view of Sriram (US 2003/0039303).

Regarding claim 1, Jones discloses the limitations: de-multiplexing a data stream to produce a plurality of de-multiplexed data streams (figure 7B1 units 464, 508 & 510 and see column 17 lines 58-62), spreading de-multiplexed data streams with a spreading code to produce a plurality of chip streams (figure 7B1 unit 476 and see column 18 lines 15-19), time shifting each chip stream by a predetermined amount (figure 7B1 unit 530 and see column 18 lines 20-25), and transmitting each time-shifted chip stream on a predetermined subcarrier (figure 7B3 units 480 & 544 and see column 18 lines 39- 42).

Jones fails to teach spreading a pilot stream to produce a spread pilot stream; and combining the spread pilot stream with a chip stream from the plurality of chip streams.

Sriram discloses a data stream spread to a chip rate with a code c_d and a pilot stream spread with a code c_c and then combining the two to form a complex stream (page 3 paragraph 0042).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Jones to incorporate the process of combining a spread pilot stream to a chip stream taught by Sriram. The motivation being a more simple method of acquiring, tracking, and/or decoding the various wireless signals.

Regarding claim 2, Jones discloses the limitations: step code multiplexing a spread pilot with the chip stream (figure 7B1 units 524, 526 & 446 and see column 18 lines 52-54).

Jones fails to teach wherein the step of combining the spread pilot stream with the chip stream comprises the step of code multiplexing the spread pilot stream with the chip stream.

Sriram discloses a data stream spread to a chip rate with a code c_d and a pilot stream spread with a code c_c and then combining the two to form a complex stream (page 3 paragraph 0042).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Jones to incorporate the process of combining a spread

Art Unit: 2663

pilot stream to a chip stream taught by Sriram. The motivation being a more simple method of acquiring, tracking, and/or decoding the various wireless signals.

Regarding claim 3, Jones discloses the limitations: differing spreading codes are used for at least two of the de-multiplexed data streams (see column 18 lines 15-19).

Regarding claim 16, Jones discloses the limitations: a de-multiplexer, de-multiplexing a data stream to produce a plurality of de-multiplexed data streams (figure 7B1 units 464, 508 & 510 and see column 17 lines 58-62), a spreader, spreading the de-multiplexed data streams with a spreading code to produce a plurality of chip streams (figure 7B1 unit 476 and see column 18 lines 15-19), a time shifter, time shifting each chip stream by a predetermined amount (figure 7B1 unit 530 and see column 18 lines 20-25), and a transmitter, transmitting each time-shifted chip stream on a predetermined subcarrier (figure 7B1 units 480 & 544 and see column 18 lines 39- 42).

Jones fails to teach a spreader, spreading a pilot stream to produce a spread pilot stream; and a combiner, combining the spread pilot stream with a chip stream from the plurality of chip streams.

Sriram discloses a data stream spread to a chip rate with a code c_d and a pilot stream spread with a code c_c and then combining the two to form a complex stream (page 3 paragraph 0042).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Jones to incorporate the process of combining a spread

Art Unit: 2663

pilot stream to a chip stream taught by Sriram. The motivation being a more simple method of acquiring, tracking, and/or decoding the various wireless signals.

Regarding claim 19, Sriram discloses the limitations: wherein differing spreading codes are used for spreading the pilot and the de-multiplexed data stream (see page 3 paragraph 0042).

Allowable Subject Matter

3. Claim 5 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

4. Claims 6-15 & 17-18 are allowed.

The following is an examiner's statement of reasons for allowance:

Regarding claim 6, the prior art fails to disclose the limitations "for a first transmission interval, mapping a first chip of a spread symbol to a predetermined subcarrier; and for a second transmission interval, mapping the first chip of a spread symbol to a second subcarrier, wherein the second subcarrier differs from the first subcarrier".

Regarding claim 10, the prior art fails to disclose the limitations "despreading the chip stream with a pilot code during a first symbol period to produce a first channel estimate for the first symbol period; despreading the chip stream with the pilot code during a second symbol period to produce a second channel estimate for the second

symbol period; generating a third channel estimate only for a portion of the first symbol period based on the first and the second channel estimates; and generating a fourth channel estimate for a second portion of the first symbol period based on the first and second channel estimates”.

Regarding claim 17, the prior art fails to disclose the limitations “a mapper, for a first transmission interval, mapping a first chip of a spread symbol to a predetermined subcarrier and for a second transmission interval, mapping the first chip of a spread symbol to a second subcarrier, wherein the second subcarrier differs from the first subcarrier”.

Regarding claim 18, the prior art fails to disclose the limitations “a channel estimator, despread the chip stream with a pilot code during a first symbol period to produce a first channel estimate for the first symbol period, and despread the chip stream with the pilot code during the second symbol period to produce a second channel estimate for the second symbol period; and an interpolator generating a third channel estimate for a portion of the first symbol period based on the first and the second channel estimates and generating a fourth channel estimate for a second portion of the first symbol period based on the first and second channel estimates”.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

Response to Arguments

5. Applicant's arguments filed March 01, 2005 have been fully considered but they are not persuasive.

On page 6 of the amendment, the applicant disagrees with the rejection of claim 4 under 35 USC 112. The applicant argues that there is no step of adding the pilot stream to another stream before being time shifted. The examiner respectfully disagrees because page 9 lines 18-23 of the specification, states: *The pilot stream is then summed with each data chip stream via summers 303. ... The resulting summed chip stream is output to time shifter 305.*

6. Applicant's arguments with respect to claims 1 and 16 have been considered but are moot in view of the new ground(s) of rejection.

On page 6 of the amendment, the applicant amends claim 1 by adding *almost all* of the limitations of claim 5. The applicant argues that the prior art fails to teach or otherwise suggest the claimed subject matter, in particular the added limitations. The examiner respectfully disagrees with applicant. Due to the fact that claim 5, in its entirety, was not incorporated into claim 1, a new search was required, which produced relevant art.

On page 7 of the amendment, the applicant amends claim 16 by adding *almost all* of the limitations of claim 5. The applicant argues for the reasons set forth with reference to claim 1. The examiner respectfully disagrees with applicant. Due to the

Art Unit: 2663

fact that claim 5, in its entirety, was not incorporated into claim 1, a new search was required, which produced relevant art.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a) Tong et al. (US 2001/0038630), Multi-Carrier Arrangement for High Speed Data


Art Unit: 2663

- b) Ma et al. (US 2003/0072254), Scattered Pilot Pattern and Channel Estimation Method for MIMO-OFDM Systems
- c) Cimini et al. (US 5914933), Clustered OFDM Communication System
- d) Sarraf et al. (US 6747948), Interleaver Scheme in an OFDM System with Multiple-Stream Data Sources

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Feben M Haile whose telephone number is (571) 272-3072. The examiner can normally be reached on 6:00am - 3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on (571) 272-3139. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



RICKY NGO
PRIMARY EXAMINER
8/13/05